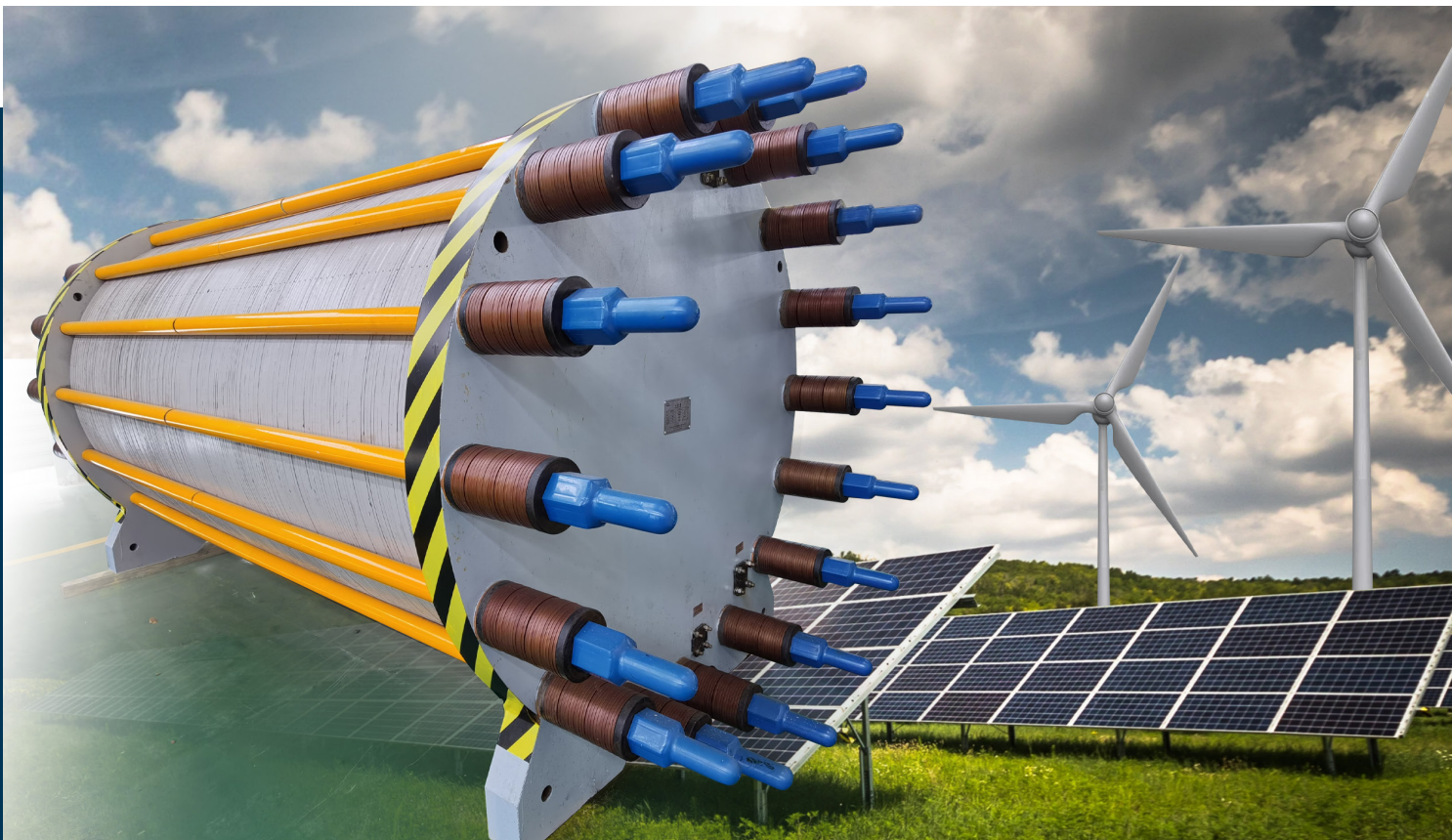


# John Cockerill, The Energy transition Leader

**H<sub>2</sub>**  
Green Hydrogen



[h2.johncockerill.com](https://h2.johncockerill.com)

# A major player in green hydrogen production solutions



John Cockerill supports the clean energy transition. By participating in the development of renewable energies - in particular green hydrogen - the Group is contributing to the fight against climate change. The development of various production lines throughout the world, dedicated to green hydrogen production technologies, positions John Cockerill as a world leader in this sector.

- **1200+ references worldwide, in 30 countries and regions**
- **Mature, reliable and high performance pressurized alkaline technology**
- **Hydrogen refueling stations, integrating compression and storage**
- **High energy efficiency**
- **Flexible and dynamic**
- **Large capacity electrolyzer stacks, 5 MW+**
- **100% European electrolyzer manufacturing chain from 2023**
- **Deployment of electrolyzer manufacturing plants worldwide**



# Innovative products at the cutting edge of technology

True to its heritage as a leading equipment manufacturer, John Cockerill is the preferred partner for hydrogen production by water electrolysis. With an estimated 20% global market share in 2022, John Cockerill offers high capacity alkaline electrolyzers producing 1000 Nm<sup>3</sup>/hr. Our 5 MW electrolyzers are among the most powerful in the world and are ideal for large-scale hydrogen production.

We develop and build

- Electrolyzers
- Hydrogen refueling stations
- Integrated solutions

## Electrolyzers

- Decades of experience in water electrolysis and hydrogen
- Reliability and guarantee of long-term optimal operation
- Quick maintenance operations with limited downtime
- Low installation labor

Main advantages of our pressurized electrolyzers



Lower electrical consumption



Higher reactivity to load variations



Low carbon footprint



Proven technology



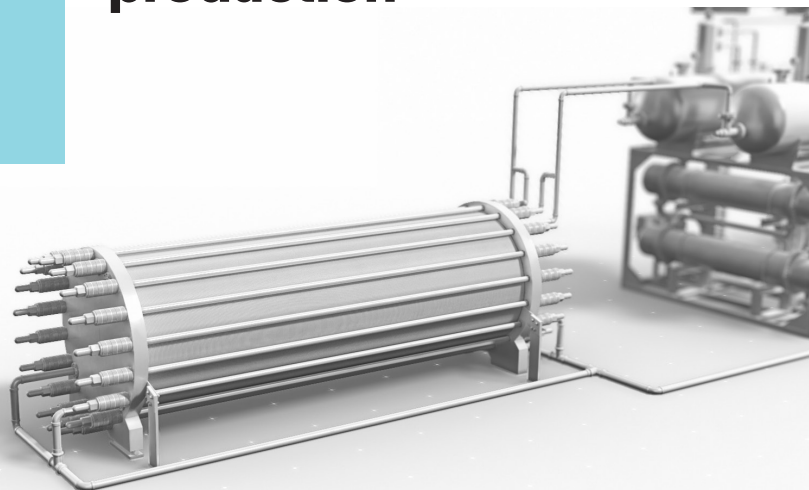
30 bar without compression



Essentially not precious metals

## The ideal solution for large-scale hydrogen production

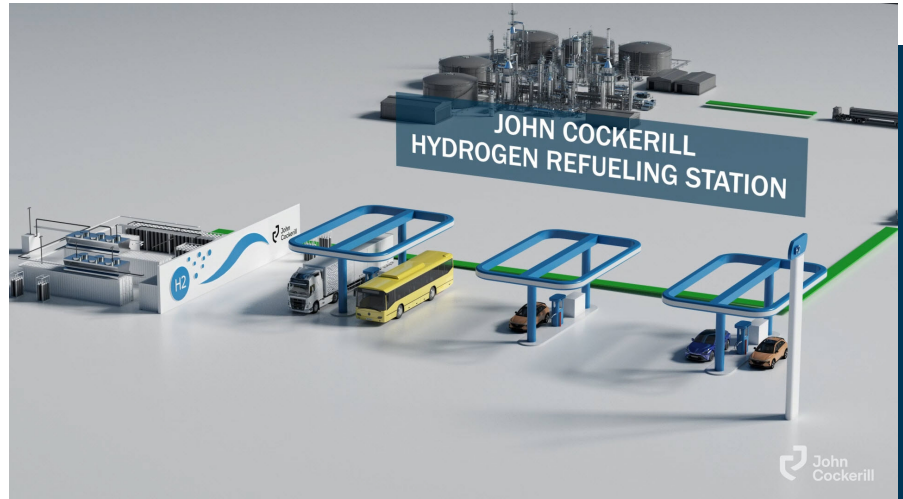
John Cockerill offers a 5 MW single stack pressurized electrolyzer, one of the largest on the market, with **over 75 units** already delivered. A large stack is essential to reduce capital and operating costs while minimizing the number of units installed and optimizing the footprint. John Cockerill's electrolyzers are particularly well suited to the constraints of intermittent solar and wind power sources because of **their high reactivity to power variations**.



# Hydrogen refueling stations

**Our hydrogen refueling stations cover a range of capacity from 200 to 2000 kg per day, at 350 and 700 bar, meeting the needs of low and high output applications such as buses and trucks.**

John Cockerill offers integrated mobility solutions compatible with any type of project configuration, including on-site hydrogen production or hydrogen supply from a centralized production unit via tube trailers or bundles at 200, 350 or 500 bar. Our mobility solutions are SAE J2601 compliant, ensuring speed and safety during vehicle refueling.



# Specialized in mass production

and distribution of green hydrogen for industry, mobility and energy



Every hour, about

**10 TONS**

of  $\text{H}_2$  is produced using our equipment



More than

**1.200**

electrolyzers delivered since 1993



Already

**78**

5 MW stacks delivered between 2018 and 2022



More than

**600 MW**

has been delivered since 1993



More than

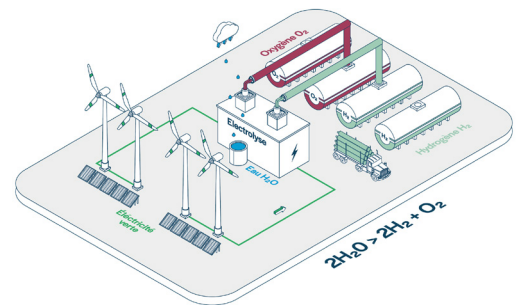
**30**

references countries

**John Cockerill Hydrogen has developed a high capacity electrolyzer compatible with many applications.**

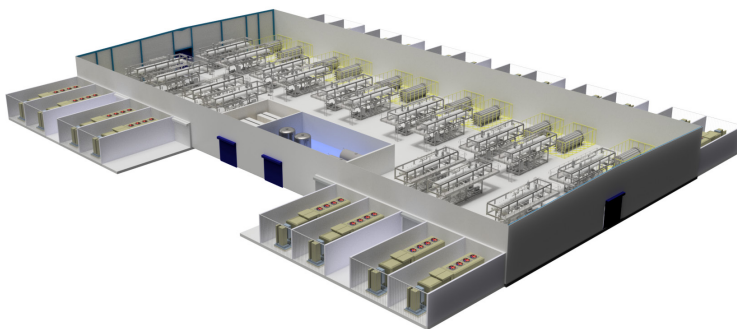
John Cockerill provides you with the heart of the process:

- The stack(s) electrolyzer
- The gas and electrolyte separation unit(s)
- Gas purification
- Water treatment and demineralization
- Electrical power supply (transformer-rectifier)



# Integrated Solutions

**We offer you the best in Engineering, Procurement and Construction (EPC) solutions. From a greenfield site to a working plant, we provide hydrogen production facilities at a competitive price, on a guaranteed date, while meeting your performance expectations.**



At John Cockerill, we provide:

Site preparation, civil works, hydrogen production units, electrical installations and the rest of the plant (demineralized water, cooling units and utilities).

John Cockerill can also assume full responsibility for the hydrogen production facility, which limits risk and simplifies interfaces for project developers and investors.

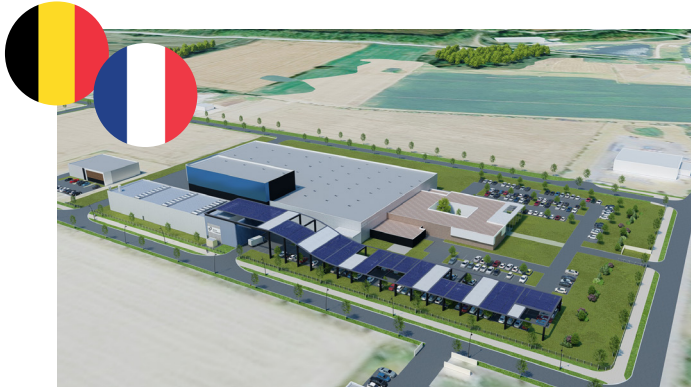
## The EPC department assists the client in the following areas

- > Engineering (basic, detailed, construction engineering)
- > Procurement (purchasing, receiving, logistics and transportation)
- > Construction (civil works, mechanical assembly, electrical installation, piping)
- > Commissioning (testing and start-up)

# Manufacturing plants

## Expanding manufacturing coverage

Leveraging the vast manufacturing expertise of John Cockerill Group, John Cockerill Hydrogen is developing a global network of electrolyzer gigafactories. By 2025, 8 GW of annual production capacity will either be operating or in construction.



- Gigafactory at the eco-responsible Aspach site  
> 300 MW/year  
> 1 GW/year by 2027
- Design Industry 4.0
- Laboratory for testing high-capacity solutions



- Based in Suzhou, the plant was the first in the world to reach an annual capacity of 350 MW when it opened in 2019
- Production capacity has since increased to 1GW/year as of 2022



### India

The first plant will launch in 2025 in partnership with Greenko (1 GW annual capacity)



### Morocco

Announcement in December 2022, of the first Gigafactory on the African continent (start-up planned for 2026)



### Other regions

To be continued...



# Columbus is an innovative Carbon Capture and Utilisation project

This project will concentrate carbon dioxide from an innovative type of lime kiln, and combine it with green hydrogen to produce synthetic methane or e-methane, a renewable gas that can be injected into the gas grid or used in the transport or industry sectors. The green hydrogen will be produced by a 100 MW electrolysis unit, powered by renewable electricity. John Cockerill has joined forces with Engie and Carmeuse to develop the Columbus project. This project has been selected as a priority project by Europe within the framework of the IPCEI\*.

Up to 162.000 tons/y of  
CO<sub>2</sub> emissions avoidance

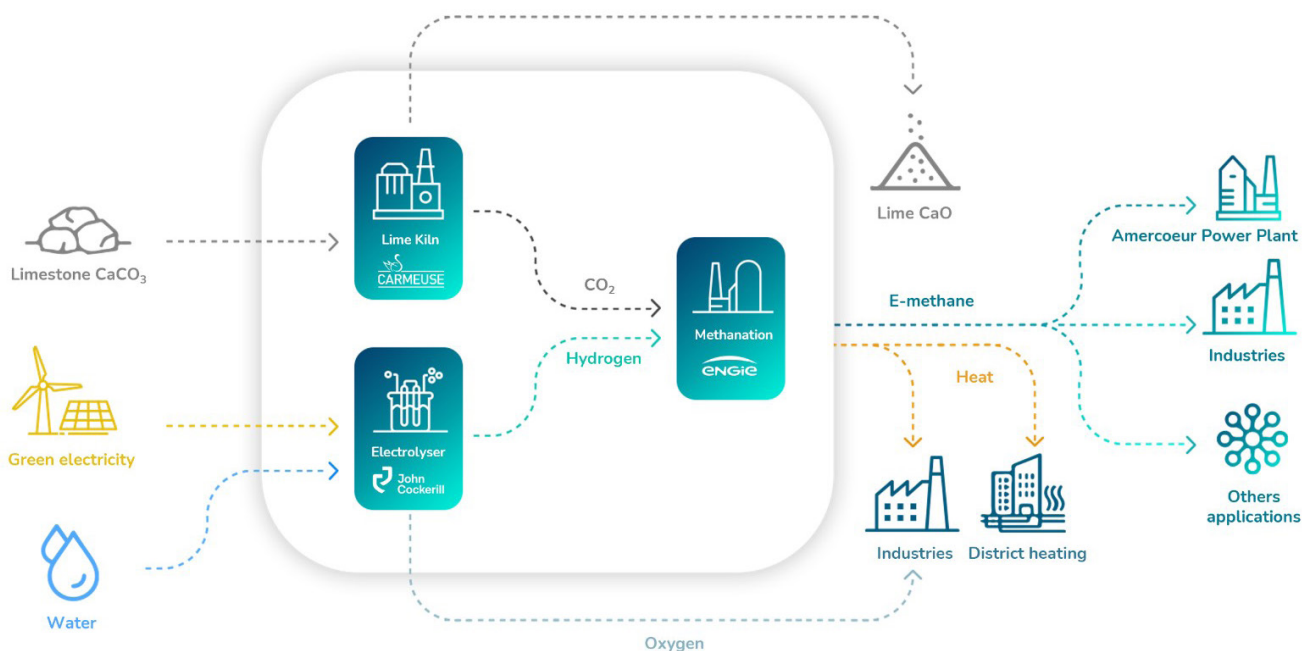
300 M€  
investment

70.000 tons/y  
of lime produced

100 MW  
of electrolyzers  
(c. 12.000 tons/y of green H<sub>2</sub>)

300 GWh/y  
of e-méthane

## How it works



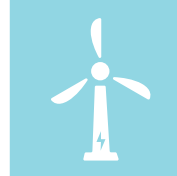
(\*) IPCEI: The Important Project of Common European Interest (IPCEI) is a European mechanism to promote innovation in strategic industrial fields through transnational European projects.

# John Cockerill

## in numbers

**Leader**  
in water  
electrolysis

**200+ years**  
of technologies  
since 1817



**Facilitating access**  
to fossil free energies

**€ 1.049 billion**  
sales figures  
in 2022

**30+ years**  
of experience  
and expertise in  
hydrogen solutions



**Enabling responsible**  
industrial production

**1200+**  
alkaline electrolyzers  
installed

**85+**  
established  
subsidiaries



**Preserving**  
natural resources

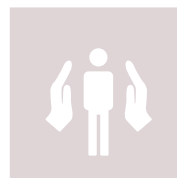
**60**  
nationalities



**Contributing**  
to a greener mobility

Private group since  
**2002**  
stable shareholding

**6000+**  
people  
worldwide



**Enhancing**  
security

Present in  
**23 countries**

Approximately  
**20%**  
market share in  
2022



**Developping**  
essential infrastructures

**Our mission:**  
Meeting the needs of our time